(Model.)

E. O. DANIELS.

PERMUTATION LOCK.

No. 359,350. Patented Mar. 15, 1887.

Fig. 1.

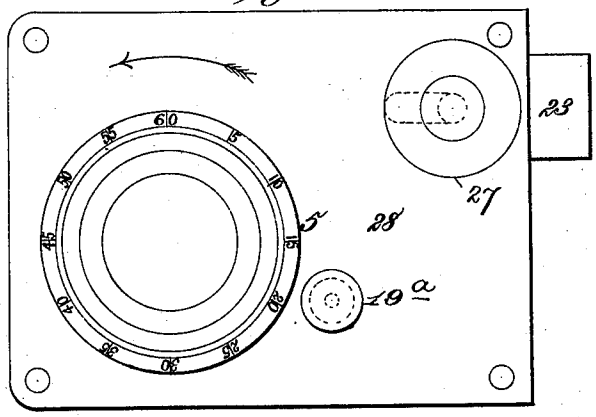


Fig. 5.

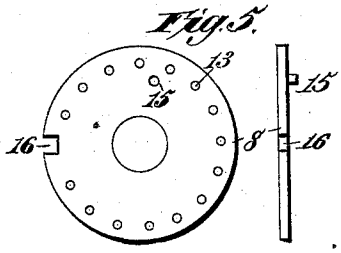


Fig. 2.

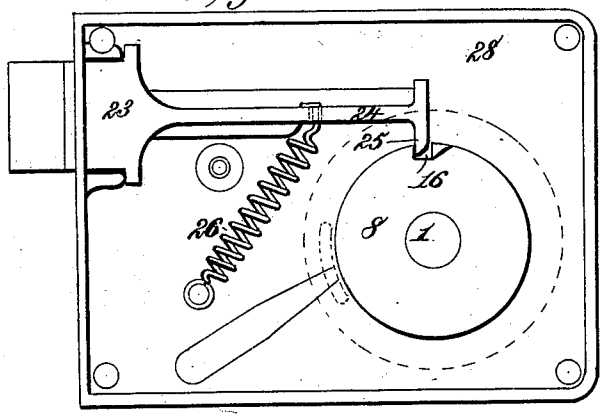


Fig. 3.

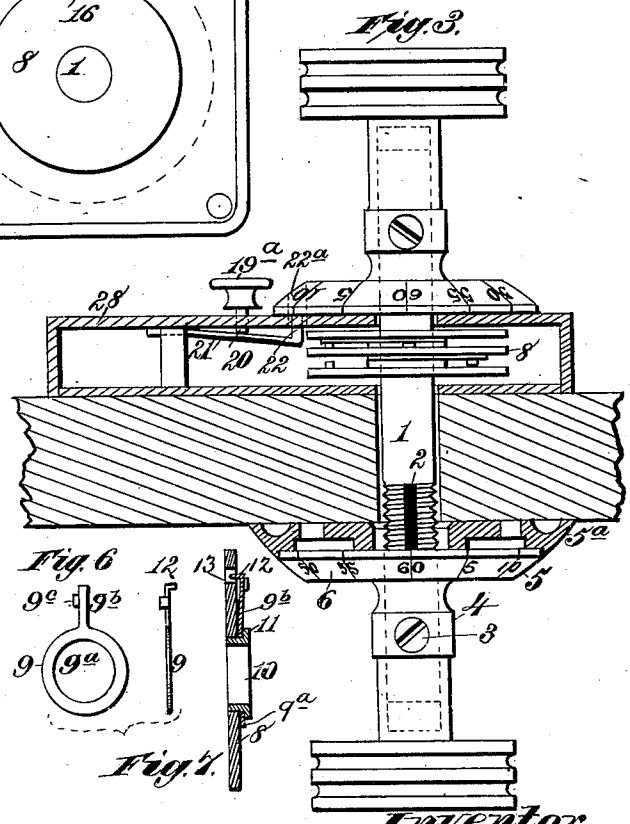


Fig. 4.



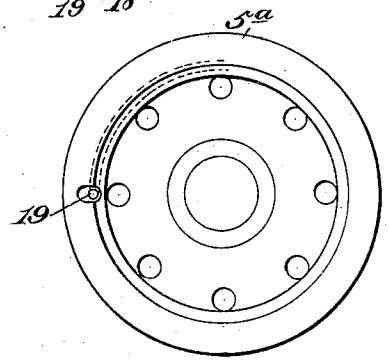


Fig. 6

Fig. 7.

Witnesses.
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UNITED STATES PATENT OFFICE.

EUGENE ORA DANIELS, OF SPRINGFIELD, OHIO.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 359,350, dated March 15, 1887.

Application filed June 28, 1886. Serial No. 206,494. (Model.)

To all whom it may concern:

Be it known that I, EUGENE ORA DANIELS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented new and useful Improvements in Permutation-Locks, of which the following is a specification.

My invention relates to permutation-locks for doors and other purposes, and the object thereof is to provide a permutation-lock which shall be practically applicable to the doors of residences, stores, and other uses.

It is also my purpose to provide independent means whereby the dial may be locked upon the inside of the door against rotation from the outer side of the door.

It is also my purpose to simplify and improve the construction of locks of the class mentioned, whereby the same are rendered more efficient in use, less liable to being picked, and capable of long-continued use without liability of disorder.

My invention consists in the several novel features of construction and combinations of parts hereinafter fully described, and pointed out in the claims annexed to and forming part of this specification.

Referring to the annexed drawings, Figure 1 is an elevation of a lock embodying my invention. Fig. 2 is an elevation of the lock shown in Fig. 1, taken from the opposite side, the lock-plate being removed. Fig. 3 is a sectional plan view showing the lock applied to a door. Fig. 4 is a detail view of the dial in plan and in cross-section. Fig. 5 is a face and edge view of one of the tumblers used in the lock. Fig. 6 is a detail face and edge view of one of the dogs connected with and actuating the separate tumblers, whereby motion is transmitted from one tumbler to the other. Fig. 7 is a detail section of one of the tumblers, showing the ring connected therewith.

In the said drawings, the reference-numeral 1 designates the lock-spindle, preferably provided with a slot, 2, cut longitudinally in that portion of the spindle which is screw-threaded, said slot being adapted to receive the end of a set-screw, 3, carried by a sleeve, 4, through which said screw is tapped, affording thereby a convenient construction, whereby the spindle may be adapted to doors of varying thickness, the groove or slot 2 being formed continuously throughout the whole or a part of the spindle, as shown in Fig. 3.

Upon the lock-spindle is mounted a dial, 5, which is divided into any desired number of divisions, 6, the line of separation between the spaces being indicated in any suitable manner.

Upon the lock-spindle 1 is mounted a series of tumblers, 8, of any desired number, and having motion communicated from one to another by means of dogs 9, (shown in detail in Fig. 6,) each dog consisting of a ring, 9^a, having a finger, 9^b, projecting from it radially and provided with an engaging-detent, 9^c, which projects from the finger in a direction parallel with the axis of the lock-spindle. Each of the tumblers 8 has a bushing, 10, provided with a flange, 11, between which and the tumbler the ring 9^a is held, as shown in Fig. 7. Each ring 9^a has a point, 12, formed on the finger 9^b, which engages with one or another of a series of perforations, 13, in the tumbler upon which the ring is mounted, said perforations being formed in line with the several points which correspond with the numbers upon the dial 5, the finger having said point 12 being also provided with the detent 9^c, which projects when the ring is in position toward the back of the adjacent tumbler, which is provided with a stud, 15, by which motion is communicated from one tumbler to the other, in order to set the combination.

When it is desired to break up the old combination and form a new one, the finger 9^b is bent outwardly to disengage the point 12 from the perforation 13 in the tumbler, and the finger and ring are then turned upon the flange 11 until the point 12 registers with the perforation which is opposite or in the same radial line with the number upon which the tumbler is to be set, whereupon the point is dropped into the opening, the elasticity of the finger 9^b being sufficient to effect and preserve the engagement.

The tumblers 8 are each provided with a notch or gate, 16, in the usual manner.

The dial-plate 5 has a beveled edge carrying the numbers and divisions, in the usual form, and is turned by the lock-spindle, said dial re-

volving in an escutcheon, 5^a. The dial is provided in its perimeter with half-round notches 17, and upon said escutcheon is fastened a leaf-spring, 18, having a pin, 19, upon its end, which drops into said notches as the dial is turned. I preferably form one of the notches 17 of greater size than the others, so as to indicate the initial or starting point, the same being located in the present case opposite the highest number on the dial. This spring-pin, acting upon the notches in the manner described, will enable the operator using the lock to easily and quickly bring the dial to the initial point in the dark, from which the combination-wheels are to be successively set.

Upon the face-plate of the lock-casing is mounted a knob, 19^a, having a shank, 20, which is tapped through the plate and rests against a spring-plate, 21, which has a point, 22, turned outward and passing through an opening in the plate and engages with a slot, 22^a, in the under face of the dial. By retracting the knob 19^a the end of the spring-plate is caused to engage with the dial upon the inner side of the door, thereby effectually preventing all attempts to operate the spindle from the outside. By turning the knob inward, on the other hand, the end of the plate is disengaged and the dial left free to turn.

The bolt 23 is of any suitable form and has a fence-lever, 24, which carries the fence or stirrup 25, resting on the edges of the tumblers and held in positive engagement by a spring, 26.

The bolt 23 may be thrown by a knob, 27, upon the inner face of the lock, but is also operated by the tumblers in one direction and the spring 26 in the other, in the usual manner.

To form the flanges 11 on the tumblers I may either cast or otherwise form the same integrally; but I prefer to use a bushing, 10, as shown, whereby the rings 9^a may at any time be readily removed. These bushings may be either soldered, riveted, or applied to the disk by frictional contact only.

What I claim is—

1. In a permutation-lock, the combination, with a spring-plate rigidly secured to the lock-casing and having a point passing through the casing, of a dial having a slot with which said point engages, and a knob having its shank adjustable in the lock-casing and bearing upon the plate, substantially as described.

2. In a permutation-lock, a leaf-spring secured to the escutcheon and carrying a pin at its free end, and a dial revolving in said escutcheon and provided with half-round notches formed in its periphery at suitable intervals, with which said pin engages as the dial revolves, one of said notches opposite the initial point from which the combination is worked out being of larger size than the others, substantially as described.

3. In a permutation-lock, the combination, with the tumblers, of bushings inserted in their central openings, each bushing having a flange, and rings mounted upon said bushings within the flange, said rings having each a finger with a bent end engaging a perforation in the tumbler and being provided with a detent adapted to engage with a stud on the back of the adjacent tumbler, substantially as described.

4. In a permutation-lock, the combination, with the tumblers having perforations 13, arranged at points corresponding to the graduations of the dial, a ring, 9^a, mounted upon a bushing, 10, and provided with a finger, 9^b, having a point, 12, and a detent, 9^c, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE ORA DANIELS.

Witnesses:
RANDOLPH COLEMAN,
WM. M. ENTLER.